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ABANDONED URANIUM MINES WORKING GROUP (AUMWG)

ANNUAL STAKEHOLDER REPORT

January 1 - December 31

2021

PREFACE

In 2013, Congress directed the U.S. Department of Energy (DOE), in consultation with the secretary of the U.S. Department of the Interior (DOI), the secretary of the U.S. Department of Agriculture (USDA), and the administrator of the U.S. Environmental Protection Agency (EPA), to conduct a review and prepare a report on approximately 4,225 abandoned uranium mines (AUMs) across the nation that provided ore to the U.S. Atomic Energy Commission (AEC) for defense-related activities. DOE assigned the Office of Legacy Management (LM) to take the lead. In August 2014, LM submitted the *Defense-Related Uranium Mines Report to Congress* (DOE 2014) (Report to Congress).

The Report to Congress has four associated topic reports: (1) mine location and status, (2) priority ranking for reclamation and remediation, (3) potential cost and feasibility for reclaiming or remediating the mines, and (4) mine risks to human health and the environment. Each of these topic reports noted and documented numerous data gaps, primarily related to three major issues: (1) the status of reclamation and remediation could only be confirmed at 15% of the mines, (2) location data was not always accurate (including information in AEC records), and (3) information about whether the mines pose risks to public health and safety and the environment was insufficient. This drove the need for a multiagency effort to fill existing data gaps and to verify and validate existing information.

The Abandoned Uranium Mines Working Group (AUMWG) — consisting of senior management and staff from DOE, DOI, USDA, and EPA — formed to maintain ongoing dialogue among the agencies and continue collaborative efforts to exchange technical and administrative information. This heightened focus on inventorying and assessing potential impacts on public health and safety and the environmental condition of these mines contributed to the initiation of DOE's Defense-Related Uranium Mines (DRUM) program.

The DRUM program aims to fill the data gaps identified by the Report to Congress and provide accurate information to help decision makers prioritize mines for additional action, if warranted. The geographic distribution and land ownership of DRUM sites requires that multiple agencies must be involved. As a result, DOE developed a phased-implementation strategy. This was also the impetus for establishing partnerships between DOE; federal land-management agencies (FMLA), including DOI and USDA; EPA, and state and tribal abandoned mine lands (AML) programs. These relationships, both formal and voluntary, are beneficial and allow partners to leverage resources on an as needed basis.

The purpose of this Annual Stakeholder Report is to communicate the AUMWG's collaborative efforts and accomplishments over the past year toward assessing, safeguarding, reclaiming, and remediating AUMs.

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EXECUTIVE SUMMARY

In 2021, the AUMWG partners reconfirmed the viability of their programmatic documents and communication strategies. The partners recognized that marshalling and leveraging the resources of multiple federal agencies increases the probability of success. Moreover, the coordinated efforts of a one-team approach are cost effective and strengthen public support. The partners worked with states and tribes to identify and address high-priority mines in an effective and coordinated manner.

This interaction and collaboration between DOE; FMLAs, including DOI, U.S. Bureau of Land Management (BLM), National Park Service (NPS), and U.S. Forest Service (USFS); EPA; and state and tribal AML programs contributed to AUMWG's formation and the ongoing implementation of the DRUM program.

The AUMWG provides a forum to exchange operational experiences, advice, and lessons learned from each partner agency's challenges and successes. Through AUMWG, the partners recognized shared objectives, coordinated schedules, and exchanged constructive information for their respective administrative and technical needs. This one-team approach is intended to expedite the protection of human health and the environment from any hazards resulting from abandoned uranium mines.

The 2021 AUMWG highlights include the following:

- ❖ The partners continued to fulfill their responsibilities to protect human health and the environment, focusing on assessments and response actions, enforcement of responsible party agreements and settlements, and community outreach.
- ❖ The partners continued to engage one another on both project and programmatic levels and assisted one another, where possible, in leveraging resources, experience, and methods.
- ❖ The DRUM program continued to verify and validate the condition of approximately 2,500 mines on public land. To date, the DRUM team has evaluated about 1,800 sites on public land, and preliminary analysis suggests the following:
 - Unprotected open mine entries, subsidence features, dangerous highwalls, and unstable structures — all associated with historical mining operations — are the primary risks.
 - Many evaluated mines rank low for risk of physical safety, chemical, or radiological hazards that may occur with public, recreational use of the neighboring land. Additional action, as determined by FMLAs, may not be necessary for these sites.

- DOE’s relative risk-screening rankings (high, medium, and low) indicate many of the mines may not need additional action. However, it is noted the relative rankings do not constitute a detailed human-health risk assessment, and FLMAs will determine actual risks at these sites in the future, as needed. The federal government could realize more than \$380 million in cost avoidance, compared to the original estimates in the Report to Congress. This cost avoidance is based on mines screened by DOE that may require safeguarding or remediation, as required under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA).¹
- ❖ The partners safeguarded physical hazards at mine sites in several locations across Colorado, New Mexico, and Utah. The DRUM team have planned additional safeguarding efforts in Utah and Colorado in 2022.

INTRODUCTION

The purpose of this Annual Stakeholder Report is to communicate the AUMWG’s collaborative efforts and accomplishments over the past year.

Formed in the aftermath of the Report to Congress, AUMWG is a consortium of federal agencies working together to address the human health, safety, and environmental challenges posed by the nation’s AUMs. By marshalling and leveraging the resources of multiple federal agencies, AUMWG works with states and tribes to identify and address high-priority mines in an effective and coordinated manner. The working group is led by LM and comprises directors, managers, and senior technical AML personnel from DOE, EPA, BLM, USFS, NPS, and the U.S. Bureau of Indian Affairs (BIA).

The DRUM team continued to navigate the challenges presented by the ongoing COVID-19 pandemic. With the safety and wellbeing of employees, contractors, volunteers, and the public in mind, many AUMWG member agencies deferred or delayed activities to mitigate exposure and transmission risk. To the best of their abilities, AUMWG agencies followed the guidance provided by the U.S. Centers for Disease Control and Prevention while continuing to deliver essential services.

Members worked with state and local health authorities to minimize the risk of COVID-19 transmission and consider the unique circumstances of each operating location. AUMWG reviewed individual state and tribal orders for exemptions and permissible essential activities. In addition, AUMWG reviewed site-specific regulatory requirements to determine what could be completed within the constraints created by the orders. Each partner agency established and implemented its own posture in response to the pandemic.

¹ DOE, 2014. *Defense-Related Uranium Mines Report to Congress*.

The *Abandoned Uranium Mines Working Group Addressing Health and Safety Risks of Abandoned Uranium Mines Multiagency Strategic Plan* (AUMWG 2020) (AUMWG Strategic Plan) guides the activities of the working group. The group normally holds quarterly calls and an annual face-to-face meeting to discuss its progress in addressing the problems posed by AUMs and share technical approaches to assessing, safeguarding, reclaiming, and remediating these mines. Due to the ongoing COVID-19 pandemic, AUMWG canceled its annual face-to-face meeting.

However, the quarterly calls occurred and were engaging, collaborative, and informative.

GOALS AND OBJECTIVES

AUMWG's goals are to (1) identify areas of common ground between the partner agencies with AUM responsibilities and (2) improve resource-allocation strategies to identify and address unacceptable risks to human health, safety, and the environment. To accomplish these goals, the working group leverages the collective experience and expertise of member agencies. This one-team approach benefits the government and overall program implementation by leveraging resources and reducing risks to human health, physical safety, and the environment.

In support of these goals, AUMWG's objectives are to:

1. Share existing information and collect site-specific data at each mine to identify potential safety hazards or human health and environmental risks.
2. Perform high-level or relative risk scoring and ranking of mine hazards.
3. Improve the data quality and content of the DRUM program and agency databases.
4. Exchange information with federal, tribal, and state governments.
5. Work together to leverage resources to address mines with priority safety hazards as well as human health and environmental risks.

A primary DRUM program goal is to provide sufficient information to partner agencies helping them make informed decisions about what, if any, actions to take to address physical hazards or human health and environmental risks from AUMs. Accomplishment of this goal facilitates the AUMWG achieving its goals and objectives.

WORKING GROUP PLANS

The AUMWG Strategic Plan and the *Abandoned Uranium Mines Working Group Communications Strategy* (AUMWG 2019) (Communications Strategy) are critical to providing the group with strategic direction and useful for guiding executive-level decisions, allocating resources, evaluating progress, and collaborating with stakeholders.

AUMWG Strategic Plan

The AUMWG Strategic Plan is a collaborative effort among the partner agencies to develop a comprehensive multiagency strategy to address the potential human health, safety, and environmental risks posed by AUMs. It summarizes the scope of the problem; provides existing information on the cleanup costs; describes the authorities and roles in addressing the hazards associated with these mines; and proposes a coordinated strategy by the agencies, along with state and tribal partners, to address these mines.

Communications Strategy

Through the Communications Strategy, AUMWG representatives will deploy an assortment of partnership-building activities and engagement opportunities to increase collaboration with communities; local, state, and tribal governments; and stakeholders. AUMWG recognizes that, to successfully implement its strategy, strong strategic partnerships and meaningful engagements with stakeholders are required.

MAJOR ACCOMPLISHMENTS

The AUMWG members continued to network, partner, and collaborate on the DRUM program and other AML activities as one team. Member agencies reconfirmed the AUMWG Strategic Plan and Communications Strategy and prepared an annual report to its stakeholders. In 2021, the AUMWG member agencies accomplished the following:

EPA

EPA continued its efforts to execute enforceable agreements with potentially responsible parties for mine and groundwater cleanup, implement the Tronox Inc. (Tronox) settlement, oversee trust settlements, and conduct fund-lead response actions, such as replacement of contaminated homes as well as assessments of high-priority mines near homes. Groundwater and surface contamination from uranium mining remain the primary concerns of communities and stakeholders near AUMs.

Issues related to the COVID-19 pandemic hampered some EPA progress in 2021. The pandemic impacted the availability of contractors, access to sites, and the ability of facility and laboratory personnel to carry out certain activities required by federal environmental permits, regulations, and statutes. However, EPA made incremental progress, including the following:

- ❖ The Tronox Resource Allocation Working Group formed to meet the Office of Inspector General commitments. The group consists of Regions 6 and 9, the Office of Land and Emergency Management, and the Office of Site Remediation Enforcement senior staff. Commitments met in 2021 included finishing the remaining draft engineering evaluation/cost analysis (EE/CA)

documents, completing the prioritization methodology, and completing a funding-allocation strategy for the settlement funds. The working group also supported ongoing coordination and consultation with the Navajo Nation and the state of New Mexico.

- ❖ EPA continued to implement the Region 6 Grants (New Mexico) Mining District Five-Year Plan to address legacy mining and milling impacts in New Mexico. This plan is a partnership with federal agencies; state environmental, mining, and health agencies; and tribal governments.
- ❖ EPA Region 6 continued community involvement to develop the new Grants Mining District Five-Year Plan. Region 6 expects to publish the plan in 2022.
- ❖ EPA created a cross-agency group to support Executive Order 14017, *America's Supply Chains*, which relates to critical minerals.
- ❖ EPA issued the Radon Vapor Intrusion Screening Level Calculator. It is used to calculate radon levels in homes or the level of radon seeping into a home under the foundation. It accounts for air exchange rates. The calculator is publicly available at <https://epa-visl.ornl.gov/radionuclides/index.html> (EPA 2022).
- ❖ EPA Region 6 continued oversight of Atlantic Richfield Company's implementation of the remedial investigation and feasibility study at the Jackpile-Paguate uranium mine on Laguna Pueblo land. The site was one of the world's largest open-pit uranium mines.
- ❖ EPA Region 6 continued the oversight of three former mine operators who are conducting the groundwater remedial investigation and feasibility study of the lower portion of San Mateo Creek. This work will identify the nature and extent of the contamination, assess the risk to human health and the environment, and analyze cleanup options.
- ❖ EPA Region 6 entered an Administrative Settlement and Administrative Order on Consent with Homestake Mining Company to conduct removal site evaluations (RSEs) for eight mines in the Ambrosia Lake region of New Mexico. The RSEs will define the nature and extent of the site contamination.
- ❖ EPA Region 8 began defining the scope of work in the Cottonwood Wash Area in Utah and worked closely with the Ute Mountain Ute Tribe for the watershed analysis of the area.
- ❖ EPA Region 8 coordinated with BLM's Utah State Office on Lisbon Valley work, which will be funded through the Tronox settlement. The goal is to assess and conduct cleanup projects at priority sites.
- ❖ EPA Region 9 awarded a construction services contract in February 2021. This will largely support cleanup at Tronox sites, but the contract can also be used for EPA-led work, such as the Contaminated Structures Program.

- ❖ EPA Region 9 completed and distributed the *Ten-Year Plan, Federal Actions to Address Impacts of Uranium Contamination on the Navajo Nation* (EPA 2021) (Ten-Year Plan). It builds on two previous Five-Year Plans (2008-2012 and 2014-2018) and identifies the next steps in addressing the human health and environmental risks associated with the legacy of uranium mining on the Navajo Nation. Region 9 distributed the Ten-Year Plan to the federal partner agencies, the Navajo Nation, and congressional representatives.
- ❖ EPA Region 9 completed draft EE/CAs for over 40 Navajo Nation AUM sites.
- ❖ EPA committed to establishing field offices in Flagstaff and Window Rock, Arizona, to support the cleanup of Navajo Nation AUMs as well as recruiting remedial project managers for the Flagstaff Field Office in 2022.
- ❖ EPA Region 9 and the Navajo Nation Environmental Protection Agency (NNEPA) created a Waste Disposal Options Work Group. The purpose of this working group, which also includes representatives from Navajo Nation Abandoned Mine Lands Reclamation Program (NAMLRP), is to discuss community, policy, and technical challenges associated with identifying and evaluating cleanup options, including EE/CAs.
- ❖ EPA continued collaborating with the DRUM program by sharing methods for conducting mine assessments, collecting technical data, addressing potential risks to human health posed by AUMs, coordinating assessment and cleanup activities, and supporting the development of DOE plans for work on tribal lands.
- ❖ The EPA Office of Mountains, Deserts and Plains worked with Regions 6 and 9 and BLM to explore and identify possible off-site disposal locations on federal land near Navajo Nation land.

DOE

The DRUM program's field season began March 8, 2021. Due to the pandemic, the field teams followed additional health and safety protocols to ensure continuation of work. To date, the DRUM team has conducted verification and validation (V&V) work at about 1,800 mines on public land. Specifically, DOE accomplished the following:

- ❖ DOE completed reconciliation of all mines in the DRUM program database and reduced the total mine count from the original estimated 4,225 mines to 3,473, due primarily to duplicate records.
- ❖ The National Nuclear Security Administration's Aerial Measuring System program completed the aerial survey of three large DRUM localities in Wyoming: Crooks Gap, Gas Hills, and Shirley Basin. The DRUM team will use the survey information to optimize its ground-based sampling efforts, focusing on areas having elevated gamma radiation levels—those areas of greatest risk. This survey saved the DRUM program more than one year and \$1 million in field work.

- ❖ DOE successfully deployed the DRUM III database upgrade and added a new “Safeguarding Information” tab to capture safeguarding-project feature data and a “Hazardous Features” table to the “Risk Evaluation” tab to facilitate the DRUM risk-screening process, among other necessary updates.
- ❖ DOE began planning for a safeguarding project at the Haystack 2 mine on Navajo Nation land.
- ❖ DOE collaborated with BLM, Colorado agencies, and industry to expeditiously safeguard a hazardous mine feature the DRUM field team discovered in southeastern Colorado. The ground over the mine collapsed, resulting in an immediate hazard for pedestrians, hunters, vehicles, and wildlife. At the request of BLM’s Tres Rios Field Office, the DRUM Program acquired material and a fence contractor to secure the area.
- ❖ The DRUM Program attended a three-part series of technical presentations and discussions with EPA Region 6, DOE Office of the General Counsel, and the U.S. Department of Justice regarding the proposed San Mateo Creek Basin legacy uranium mine Superfund site in Cibola and McKinley Counties, New Mexico. The general notice letter that DOE and DOI received from EPA Region 6 indicated they may be partially responsible under the CERCLA (Title 42 *United State Code* Section 9601 et seq. [42 USC 9601 et seq.]) for cleanup.
- ❖ DOE worked with NAMLRP, NNEPA, and EPA Region 9 to provide a chapter on the DRUM program in EPA’s Ten-Year Plan, identifying the next steps in addressing the human health and environmental risks associated with the legacy of uranium mining and milling on the Navajo Nation.
- ❖ DOE met with EPA Region 6 to discuss the Grants Mining District Five-Year Plan. Federal, state, and tribal agencies are partners to the plan, which addresses contamination caused by legacy uranium mining and milling operations in the mining district. The DRUM program will contribute the resources to inventory and safeguard DRUM sites in that mining district.
- ❖ DOE completed the *Defense-Related Uranium Mines (DRUM) Safeguarding Program Management Plan (LMS/DRM/S33217)* (Safeguarding Program Management Plan), providing the structure and basis for the management of safeguarding, monitoring, and maintenance of hazardous mining-related features at DRUM sites.
- ❖ DOE established new interagency agreements with NPS and the USFS Washington, D.C., Office to support V&V activity and safeguarding.
- ❖ DOE conducted a National Environmental Policy Act (NEPA) (42 USC 4321 et seq.) Categorical Exclusion Evaluation to conduct safeguarding, monitoring, and maintenance activities on DRUM sites on federal, state, and tribal land in accordance with the DRUM Safeguarding Program Management Plan.

- ❖ DOE initiated discussions with several EPA regional offices regarding the next campaign to verify and validate AUMs on tribal lands. DOE will develop specific campaign methodologies with tribal AML programs and EPA. The DRUM sites are primarily on Navajo Nation land (96%) and are unique when compared to mines on public land, since tribal members may live on or near DRUM sites.
- ❖ The BLM Montana/Dakotas State Office requested expedited V&V assessment for an area in the Pryor Mountains, which is directly south of Billings, Montana. For many years, concerns about possible radiation in this area, residual from legacy mining, have delayed completion of a proposed trail system. The proposed trail system and recreation sites intermingle with a few DRUM sites in the area, creating what could be a public health concern. The DRUM program completed V&V activities on the seven of 11 mines in the area, so BLM could continue recreation trail planning.
- ❖ DOE presented aerial gamma radiation survey plans of large mines in Wyoming at the International Atomic Energy Agency (IAEA) Virtual Annual Meeting of the Coordination Group for Uranium Legacy Sites (CGULS). CGULS currently focuses on uranium legacy sites in the former Soviet Central Asian Republics of Tajikistan, Kyrgyzstan, and Uzbekistan to help those countries better understand what activities may be necessary at abandoned mine sites.
- ❖ DOE participated in the virtual 2021 National Association of Abandoned Mine Lands Programs conference and presented on the status of the DRUM Program, project achievements, and planned future work.
- ❖ DOE participated in the virtual 2021 IAEA Regulatory Supervision of Legacy Sites technical meeting and presented on prioritizing reclamation of safety hazards at AUMs in the United States.

DOE continued to form and revise necessary partnership agreements among the various federal and state entities to accomplish the V&V work and to safeguard physical safety hazards, such as hazardous mine openings, at AUMs. Most notably, DOE continued its cooperative agreement with Bat Conservation International, providing long-term access to the spectrum of contracting services needed to safeguard mines on public land, such as project development, environmental review (including NEPA documentation), and design and construction.

The DRUM program is well underway. Table 1 shows the program's progress to date by state. Notably, the DRUM program has preliminarily investigated over 3,400 acres of public land containing AUMs.

Table 1. Progress of the DRUM Program by State

State	Estimated Number of DRUM Sites ^a	Current DRUM Site Estimate	Field V&V Operations Completed (12/31/2021)	Field V&V Operations Remaining
Alaska	1	1	0	1
Arizona	413	361	0	361
California	26	24	0	24
Colorado	1,539	1,251	870	381
Florida	1	1	0	1
Idaho	7	6	0	6
Missouri	0	1	0	1
Montana	19	21	7	14
Nevada	24	22	0	22
New Jersey	1	1	0	1
New Mexico	247	227	59	168
New York	0	2	0	2
North Dakota	14	12	0	12
Oklahoma	2	2	0	2
Oregon	4	3	0	3
Pennsylvania	1	1	0	1
South Dakota	155	141	26	115
Texas	29	29	0	29
Utah	1,380	1,089	791	298
Washington	17	15	0	15
Wyoming	319	261	38	223
Unknown	26	2	0	2
Totals	4,225	3,473	1,791	1,682

^a This represents the estimated number of DRUM mines per state presented in 2014 Report to Congress.

The DRUM program assisted FLMA's in safeguarding the immediate hazards posed by physical mine features. This was accomplished while honoring historical, cultural, and ecological values at individual mine sites. These hazards are primarily unprotected open mine entries, subsidence features, or dangerous highwalls. Table 2 describes the safeguarding projects performed this past year and their associated closure costs.

Table 2. 2021 Safeguarding Projects

State	Project Area	Features Safeguarded	Cooperating Land Management Agency	Total Cost (\$)	Cost Per Feature (\$)
Colorado	BLM/Colorado DRMS				
	Long Park 2	20	BLM Uncompahgre Field Office	58,840	2,942
	Martin Mesa	20	BLM Uncompahgre Field Office	80,711	4,036
	Prayer 9	1	BLM Uncompahgre Field Office	182,337	182,337 ^a
	Long Park Mixed	21	BLM Uncompahgre Field Office	47,250	2,250
New Mexico	BLM/New Mexico				
	Grants	17	BLM New Mexico State Office	44,894	2,641
Utah	BLM/Utah AMRP				
	Mineral Canyon	29	BLM Moab Field Office	137,475	4,741
	Buckmaster II	51	BLM Price Field Office	225,900	4,429
Total		159			3,507

Note:

^a Removed from the total average cost per feature calculation so as not to overly inflate the figure.

Abbreviations:

AMRP = Abandoned Mine Reclamation Program

DRMS = Division of Reclamation, Mining, and Safety

BIA

As a trustee for tribal mine sites, BIA continued to participate in community outreach efforts, ensuring that tribes are informed and consulted, both formally and informally. BIA monitored the ongoing work at tribal sites and provided long-term monitoring of institutional controls and completed remedies.

BIA also prepared the supporting NEPA documentation for the safeguarding of the Haystack 2 mine on Navajo Nation land. This safeguarding project should be completed in 2022.

BLM

BLM continued its inventory, assessment, and cleanup of AUM sites. BLM made progress, despite the constraints caused by available funding and the ongoing pandemic. BLM leveraged program funding for contracts and existing agreements with state agencies to continue its response actions at AUM sites under its purview. BLM is partnering with DOE so both agencies can leverage resources to collectively perform DRUM program inventory work and safety closures on BLM-managed land.

- ❖ BLM collaborated with DOE to facilitate numerous V&V operations in Colorado and Utah, primarily focusing on mines within the Colorado Tres Rios Field Office.
- ❖ BLM began working with DOE to prepare numerous Field Operations Plans (FOPs) for V&V efforts scheduled to start in 2022, including V&V work at the remaining mining districts in Colorado, Utah, and Arizona.
- ❖ BLM accomplished AUM-safeguarding projects in Colorado, New Mexico, and Utah (see Table 2) by partnering with DOE; the Colorado Division of Reclamation, Mining, and Safety; and Utah's Abandoned Mine Reclamation Program.
- ❖ BLM's Colorado State Office continued inventorying non-DOE, non-Freeport-McMoRan Inc. AUM sites and, to date, inventoried over 1,400 sites on BLM-managed land throughout western Colorado. Mine features deemed to be of extremely high physical safety risk were signed, fenced, or both.
- ❖ BLM's Utah State Office worked with the BLM National Operations Center and its support contractor to review DRUM V&V reports and risk roll-up reports.
- ❖ BLM's Utah State Office worked with EPA Region 8 on time-critical removal actions in the Lisbon Valley region. These removals are part of the Tronox settlement. BLM accomplished all field-reconnaissance work in May 2021. BLM is conducting document review and establishing a memorandum of understanding.
- ❖ BLM's Montana/Dakotas State Office requested expedited DRUM V&V work on mines in the Pryor Mountains area to facilitate recreation trail planning.

USFS

USFS continued its assessment and cleanup of AUM sites, commensurate with annual funding and relative project prioritization. Additional funding would permit USFS to conduct a complete AUM inventory and evaluate these sites for their potential environmental impact. Despite funding constraints and the ongoing pandemic, USFS made incremental progress, including the following:

- ❖ USFS partnered with EPA regions, as well as states and DOE, to leverage agency resources and collectively address AUMs on National Forest System land.
- ❖ USFS facilitated concurrence with the supervisor for the Manti-La Sal National Forest to execute safeguarding projects in the future.
- ❖ USFS began planning for DRUM safety closures in Arapaho-Roosevelt National Forest and Pike-San Isabel National Forest.
- ❖ USFS, along with BLM, NPS, and DOE, virtually hosted the Interagency Abandoned Mine Safety Training course, addressing topics, such as surface and underground mine features and hazards.

- ❖ USFS continued assessing and cleaning up other AUMs on National Forest System land. USFS plans to award the contract and start construction for remediation and removal-in-place for the Bluff B mine near Riley Pass, South Dakota.
- ❖ USFS executed an interagency agreement to fund their support of DOE and its contractors throughout DRUM-safeguarding projects in individual national forests nationwide.
- ❖ USFS successfully worked with DOE, state of Colorado, and other partner agencies to import existing data into its new AML database.

Most notably, USFS developed and instituted its first ever AML database. The database includes AML features derived from historic inventory and field observations taken by USFS staff and state and federal partners. It records the location, type, associated mines (if any), and other important details of the AML features, including whether any previously completed safety mitigation. Features are individual physical hazards resulting from previous mining activity, such as adits, shafts, pits, vehicles, equipment, dilapidated structures, and refuse. The database does not contain environmental hazard or sampling information. It is strictly devoted to recording the presence and types of physical hazards at historic mine sites and mine claims on National Forest System land.

NPS

NPS continued to investigate of the nature and extent of contamination at the Orphan mine site in Grand Canyon National Park, using its CERCLA authority. NPS intends to identify a recommended cleanup action for the upper mine area in the near term and address the lower mine area in the future, as they are generally inaccessible to park visitors.

- ❖ NPS entered into an interagency agreement with DOE to facilitate inventory, environmental, and safeguarding activities at DRUM sites. The agreement reflects the natural resource stewardship approach of NPS as well as the guiding statutes.
- ❖ NPS is working with all FOP-specified parks with mines on NPS land, ground truthing DOE proposed access routes, revising environmental restrictions, updating points of contact for each park, confirming mine additions and location changes provided by DOE, and starting the NEPA process for site assessments in preparation for DRUM field activities in 2022.

BENEFIT POTENTIAL

Several benefits can be achieved when AUMWG and its partner agencies collectively address the hazards posed by AUMs. With effective partnerships and collaboration, the cleanup and restoration of an AUM site can provide significant economic, public health, and environmental benefits.

Background

Uranium mining has a long history in the United States. After the Atomic Energy Act of 1946 (42 USC 2011 et seq.), AEC facilitated a mining boom, offering incentives and guaranteed prices as the sole purchaser of uranium. Uranium mines initially opened in the states of Utah, Colorado, New Mexico, and Arizona and then rapidly spread to other states. When mining ventures were no longer economically viable, prospectors abandoned their mines without being subject to the closure and cleanup requirements of present-day regulation. Most abandoned mines have no responsible or solvent party to perform the safeguarding or reclamation, so the federal government, including the AUMWG agencies, has undertaken the extensive effort to assess and clean up the mines. There are still many abandoned mines that may pose significant safety hazards.

Nearly 11% of AUM sites are on tribal lands, and the vast majority of these are on Navajo Nation land. Because the radiological risks are not visually evident, mine waste material was used in construction of some homes, and some homes were built directly on top of mine waste.

Benefits

As part of its commitment to finding effective solutions to address the potential threats that abandoned mines pose to human health, safety, and the environment, AUMWG is focusing significant attention on the potential future uses of these lands and on the economic, environmental, and social impact of reuse on the neighboring communities.

AUMWG is critical to achieving these benefits, which include:

- Reclaiming and reusing thousands of acres of formerly contaminated land.
- Safeguarding historic mining areas for recreational visitation and tourism.
- Providing neighboring communities with new opportunities to grow and prosper.
- Creating, preserving, and restoring land for recreational and ecological purposes.
- Creating and enhancing wildlife habitats.
- Restoring the connection between local communities and the impacted area.
- Maintaining the protective use of the land.
- Sustaining the environment for future generations.

CONCLUSION

AUMWG successfully fostered dialogue among partner agencies, enabled community and stakeholder engagement, and collaborated to address the human health, safety, and environmental challenges posed by AUMs. By orchestrating the resources and efforts of multiple federal agencies, the working group helped states and tribes identify and address high-priority mines in an effective and coordinated manner. Acting as one team was essential to the group's overall success.

Notably, the DRUM program is 75% complete for AUMs on public land. Based on preliminary analysis of data collected from ongoing mine evaluations, concerns regarding physical hazards continue, since they are an immediate threat to humans and wildlife. These hazards mostly consist of unprotected open mine entries, subsidence features, dangerous highwalls, and large unstable structures associated with historic mining operations.

To date, the DRUM program has found most mines to be potential candidates for no additional action by FLMAs. Since many sites on public land may not need additional action, the federal government could realize over \$380 million in cost avoidance as compared to the estimates made in the Report to Congress. However, this trend may not continue for the remaining mines because of factors, such as geological formations, mining methods, and land-use risk scenarios.

The AUMWG partners continued to fulfill their imperative responsibility to protect human health and the environment. Their efforts focused on assessments and response actions, enforcement of responsible party agreements and settlements, and community outreach. The team made great strides, but more progress is needed.

Finally, as part of its commitment to finding effective solutions to address the potential threats that AUMs pose to human health, safety, and the environment, AUMWG paid significant attention to the potential future uses of these lands and to the economic, environmental, and social impact of reuse on the neighboring communities. This attention is important for sustaining the environment for future generations.

REFERENCES

4 Stat. 564. "Appointment of a Commissioner of Indian Affairs," *Statutes at Large*, July 9, 1832.

25 USC 1. "Commissioner of Indian Affairs and Agreement Between the Secretary and the Tribal Government," *United States Code*.

APPENDIXES

APPENDIX A
Abbreviations List

AEC	U.S. Atomic Energy Commission
AML	abandoned mine lands
AUM	abandoned uranium mine
AUMWG	Abandoned Uranium Mines Working Group
BIA	U.S. Bureau of Indian Affairs
BLM	U.S. Bureau of Land Management
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CGULS	Coordination Group for Uranium Legacy Sites
COVID-19	coronavirus disease of 2019
DOE	U.S. Department of Energy
DOI	U.S. Department of the Interior
DRUM	Defense-Related Uranium Mines
EE/CA	engineering evaluation/cost analysis
EPA	U.S. Environmental Protection Agency
FLMA	federal land management agency
FLPMA	Federal Land Policy and Management Act
FOP	Field Operations Plan
LM	Office of Legacy Management
NAMLRP	Navajo Nation Abandoned Mine Lands Reclamation Program
NEPA	National Environmental Policy Act
NFMA	National Forest Management Act
NNEPA	Navajo Nation Environmental Protection Agency
NPS	National Park Service
PL	Public Law
RSE	removal site evaluation
SARA	Superfund Amendments and Reauthorization Act
SMCRA	Surface Mining Control and Reclamation Act
Stat.	<i>Statutes at Large</i>
USC	<i>United States Code</i>
USDA	U.S. Department of Agriculture
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service
V&V	verification and validation

APPENDIX B

Agency Authorities

This appendix documents the statutes that provide authority to the AUMWG partner agencies. It defines the extent of powers and responsibilities held by the agencies that must be consistent with constitutional constraints and legislative intent.

Atomic Energy Act

Title 42 *United States Code* Section 2011 et seq. (42 USC 2011 et seq.) (1954)

This federal law covers the development, regulation, and disposal of nuclear materials and facilities in the United States. It was an amendment to the Atomic Energy Act of 1946 and substantially refined certain aspects of the law, including increasing support for the possibility of a civilian nuclear industry. Notably, it made it possible for the government to allow private companies to gain technical information (Restricted Data) about nuclear energy production and the production of fissile materials, allowing for greater exchange of information with foreign nations as part of President Dwight D. Eisenhower's Atoms for Peace program. It reversed certain provisions in the 1946 law, which had made it impossible to patent processes for generating nuclear energy or fissile materials.

Bureau of Indian Affairs (BIA)

25 USC 1 et seq. (1969)

Congress gave BIA statutory authority by the Act of July 9, 1832, Volume 4 *Statutes at Large* page 564 (4 Stat. 564). In 1849, BIA was transferred to the newly created U.S. Department of the Interior (DOI). DOI adopted the agency's name on Sept. 17, 1947. BIA carries out its core mission to serve 574 federally recognized tribes through four offices. The Office of Indian Services operates BIA's general assistance, disaster relief, child welfare, tribal government, Indian Self-Determination, and Indian Reservation Roads programs. The Office of Justice Services directly operates or funds law enforcement, tribal courts, and detention facilities on federal tribal lands. The Office of Trust Services works with tribes and individual American Indians and Alaska Natives in the management of their trust lands, assets, and resources. Finally, the Office of Field Operations oversees 12 regional offices and 83 agencies which carry out the mission of the bureau at the tribal level.

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)

42 USC 9601 et seq. (1980)

The act provides a federal "Superfund" to clean up uncontrolled or abandoned hazardous waste sites as well as accidents, spills, and the release or threatened release of pollutants and contaminants into the environment. Through CERCLA, EPA was also given authority

to require parties responsible for contamination to either perform cleanups or reimburse the government for EPA-led cleanup work.

While other federal agencies have authority to clean up federal land, EPA is the lead agency for cleanups on private and mixed-ownership sites.

EPA cleans up orphan sites when potentially responsible parties cannot be identified or located or when they fail to act. Through various enforcement tools, EPA obtains private party cleanup through orders, consent decrees, and other settlements. EPA also recovers costs from financially viable individuals and companies upon response action completion.

EPA is authorized to implement the act in all 50 states and U.S. territories. EPA may undertake Superfund site identification, monitoring, and response activities in coordination with state and tribal environmental protection or waste management agencies.

The Superfund Amendments and Reauthorization Act (SARA) of 1986 (Public Law 99–499 [PL 99–499]) reauthorized CERCLA to continue cleanup activities around the country. Lawmakers added several site-specific amendments, definition clarifications, and technical requirements to the legislation, including additional enforcement authorities. Also, Title III of SARA authorized the Emergency Planning and Community Right-to-Know Act.

Under CERCLA, the secretary of the interior has the authority to address the release or threatened release of hazardous substances, pollutants, and contaminants on or from land under DOI’s jurisdiction, custody, or control. The secretary has delegated this authority to the bureau directors. In addition, under CERCLA, DOI is designated as a trustee for natural resources and must act as such on behalf of the public.

Federal Land Policy and Management Act (FLPMA)

PL 94–579 (1976)

This federal law governs the way in which the public land is administered by USFS, BLM, USFWS, and NPS. The act phased out homesteading in the United States by repealing the pre-existing homestead acts. Congress recognized the value of the public land, declaring that these lands would remain in public ownership. USFS, USFWS, NPS, and, BLM are commissioned in FLPMA to allow a variety of uses on their land while simultaneously trying to preserve the natural resources within it. This concept is best summarized by the term “multiple use.”

The term “multiple use” is defined in the act as “management of the public lands and their various resource values so that they are utilized in the combination that will best meet the present and future needs of the American people.”

The act addresses topics like land-use planning, land acquisition, fees and payments, administration of federal land, range management, and rights-of-way on federal land. The law specifies objectives and time frames in which to accomplish them, which contributes to its authority and eliminates the uncertainty surrounding BLM’s role in wilderness designation and management.

National Forest Management Act (NFMA)

PL 94–588 (1976)

This federal law is the primary statute governing the administration of national forests and was an amendment to the Forest and Rangeland Renewable Resources Planning Act of 1974, which called for the management of renewable resources on National Forest System land.

The main objectives of NFMA are to require USFS to develop plans for national forests, set standards for timber sales, and create policies to regulate timber harvesting. The purpose of these objectives is to protect national forests from permanent damage from excessive logging and clear cutting. Congress requires USFS, in conjunction with other appropriate agencies, to thoroughly assess, research, and plan for the nation’s renewable resource use, including the current demand, anticipated demands, and environmental and economic impacts.

USFS’s abandoned mine lands program uses this act to restore the land disturbed by historic mining activities. There are approximately 40,000 abandoned mine sites on National Forest System lands. Of those, 34% were mines with records of mineral production.

National Park Service Organic Act

PL 64–235 (1916)

This federal law established NPS, an agency of DOI. NPS, as established by the act, promotes and regulates the use of the federal areas known as national parks, monuments, and reservations in order to conserve the scenery, the natural and historic objects, and the wildlife therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations.

Surface Mining Control and Reclamation Act (SMCRA)

30 USC 1201 et seq. (1977)

This act provides for cooperation between the secretary of the interior and the states with respect to the regulation of surface coal-mining operations, the acquisition and reclamation of abandoned mines, and other purposes.

SMCRA created two programs: one for regulating active coal mines and a second for reclaiming abandoned mine lands. SMCRA also created the Office of Surface Mining Reclamation and Enforcement, an agency within DOI, to promulgate regulations, fund state regulatory and reclamation efforts, and ensure consistency among state regulatory programs.

The regulation of active mines under SMCRA has five major components:

- ❖ **Standards of performance.** SMCRA and its implementing regulations set environmental standards that mines must follow while operating and that must be achieved when reclaiming mined land.
- ❖ **Permitting.** SMCRA requires that companies obtain permits before conducting surface mining. Permit applications must describe what the premining environmental conditions and land use are, what the proposed mining and reclamation will be, how the mine will meet the SMCRA performance standards, and how the land will be used after reclamation is complete. This information is intended to help the government determine whether to allow the mining and set requirements in the permit that will protect the environment.
- ❖ **Bonding.** SMCRA requires that mining companies post a bond sufficient to cover the cost of reclaiming the site. This is meant to ensure that the mining site will be reclaimed even if the company goes out of business or fails to clean up the land for some other reason. The bond is not released until the mining site has been fully reclaimed and the government has found that the reclamation was successful.
- ❖ **Inspection and enforcement.** SMCRA gives government regulators the authority to inspect mining operations and to punish companies that violate SMCRA or an equivalent state statute. Inspectors can issue notices of violation, which require operators to correct problems within a certain amount of time, levy fines, or order that mining cease.
- ❖ **Land restrictions.** SMCRA prohibits surface mining altogether on certain lands, such as national parks and wilderness areas. It also allows citizens to challenge proposed surface mining operations on the grounds that they will cause too much environmental harm.

Surface Resources Act

PL 84–167 (1955), 30 USC 611 et seq.

This act allows BLM to address abandoned mine openings on active mining claims staked after 1955 as long as the proposed closure work does not endanger or materially interfere with actual, established prospecting, mining, or processing operations or reasonably incidental uses. Therefore, BLM is authorized to take the necessary steps to protect public safety and prevent further unnecessary and undue degradation caused by abandoned mines.

